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PLANETARY PHENOMENA FOR JULY AND AUGUST, 1921

By MALCOLM McNEILL

PHASES OF THE MOON, PACIFIC TIME.

New Moon.....	July 5, 5 ^h 36 ^m A.M.	New Moon...August 3, 12 ^h 17 ^m P.M.
First Quarter.....	" 11, 8 16 P.M.	First Quarter. " 10, 6 14 A.M.
Full Moon.....	" 19, 4 8 P.M.	Full Moon.... " 18, 7 28 A.M.
Last Quarter.....	" 27, 6 20 P.M.	Last Quarter.. " 26, 4 51 A.M.

The Earth reaches aphelion, its greatest distance from the Sun, at 11 P. M. July 3, Pacific Time.

Mercury on July 1 is an evening star too near the Sun for naked eye view. On July 7 it passes inferior conjunction and becomes a morning star. It reaches greatest west elongation $19^{\circ}41'$, on July 28, and comes to superior conjunction on August 23. The greatest elongation is not a very favorable one being much smaller than the average, and midsummer western elongations give only moderately good opportunity for naked eye view, but from the middle of July until after August 1 the planet rises more than an hour before sunrise, so that under good weather conditions it may be seen. *Mercury* will be in conjunction with *Mars* twice during the two months' period, on July 9 and on August 10. On the former date the planets are too near the Sun, both having passed conjunction with the Sun within a few days. On the latter date they are farther away from the Sun but still too near for easy observation, but the conjunction is unusually close, only $11'$, or about one-third of the Moon's diameter.

Venus is a morning star having passed greatest west elongation on July 1 and thruout the period rises from two and one-half to three hours before sunrise. The interval changes only a little until the middle of September altho the elongation diminishes steadily from July 1, but the relative motions of the Sun and planet put *Venus* increasingly northward of the Sun, thus accelerating the time of rising of the planet.

Mars passed conjunction with the Sun on June 28 and became a morning star. It will continue as such for a little more than a year, but will not be far enough away from the Sun for naked eye observation until near the end of August. It will then rise about an hour and a half before sunrise, and may be seen altho still at about its faintest. It reaches its greatest distance from the Earth on July 19 and this will not be materially diminished until October. Its conjunctions with *Mercury* have already been noted.

Jupiter is still in good position for evening observation, setting a little before 11 P. M. on July 1, and shortly after 7 P. M. on August 31. It is in the eastern part of the constellation *Leo*, and moves 10° eastward and 5° southward during the two months. On August 31 it is about 12° south of *Denebola*, β *Leonis*, a second magnitude star in the extreme eastern end of the constellation. Its greater eastward motion brings it nearer and nearer to *Saturn*, so that by the end of August their distance apart is only about one degree, and they will come to conjunction on September 14.

On July 1 *Saturn* is about 6° east of *Jupiter* and like it moving eastward, but at a much slower rate. It sets less than half an hour later on July 1, and this interval diminishes to about 6 minutes by the end of August. On August 3 the Earth passes thru the plane of the rings so that the Sun and Earth are again on the same side of the plane.

This completes the cycle of disappearance and reappearance of the rings which began early in November, 1920, when the Earth crossed the plane of the rings. The Earth and Sun were then on opposite faces of the rings until February 22 when the Earth again crossed the plane to the same side as the Sun. This condition continued until April 10 when the Sun crossed the plane and Sun and planet were once more on opposite sides. Finally early in August the Earth again crosses the plane bringing Sun and Earth on the same side of it. This condition will continue until 1935 when the motion of *Saturn* again brings the plane of the rings near to the Earth and the Sun. The phenomena are not always as complicated. When the Sun, Earth, and *Saturn* are on the same line at a time of passing the plane of the rings, the crossings of the Sun and Earth are simultaneous, and there is no distinction between them. This of course never happens exactly, but sometimes the entire series is performed in a very few days, there being practically only one disappearance.

For owners of small telescopes the rings will be practically out of sight until the end of August but after that they may be seen as a narrow streak gradually broadening to a distinct ellipse toward the end of the year. Owners of powerful telescopes can perhaps find something new as to the thickness and irregularities of the rings which small telescopes can not show.

Uranus is gradually getting into position for observation altho it is about at the limit of naked eye visibility. On July 1 it rises

before 11 P. M. and at about sunset on August 31. It comes to opposition with the Sun on August 31. During the two months it moves 2° westward and nearly 1° southward in the constellation *Aquarius*. At the end of August it is 2° west and 1° south of the fourth magnitude star λ *Aquarii*.

Neptune comes to conjunction with the Sun on August 6 and is too near that body during most of the time for visibility even with a good telescope.

THE BERKELEY MEETING OF THE ASTRONOMICAL SOCIETY OF THE PACIFIC, AUGUST 5, 1921

Meetings of the Astronomical Society of the Pacific will be held in Room 1, Students' Observatory, University of California, Berkeley, at 9 o'clock, Friday morning, and 2 o'clock Friday afternoon, August 5, 1921, in connection with the meeting of the Pacific Division of the American Association for the Advancement of Science.

Those expecting to present papers should submit titles, with brief abstracts ready for publication, to S. Einarsson, Students' Observatory, University of California, as soon as possible. Please state whether or not a lantern is needed, and give estimation of time necessary for presentation of paper.

Participation in these meetings is not restricted to members of the Astronomical Society of the Pacific. All who are interested are cordially invited to attend.

On Thursday morning, August 4th, a meeting of the American Physical Society will be held, at which papers of interest to astronomers will be presented.

An excursion to the Lick Observatory, Mount Hamilton, is planned for the afternoon and evening of Saturday, August 6th. All members of the American Association for the Advancement of Science desiring to make this trip should communicate with Mr. W. F. Meyer, Students' Observatory, University of California, not later than noon of Thursday, August 4th.

THE COMMITTEE ON PROGRAM.